Number of Wire Centers: 528
Number of Switched Lines: 9,399,197

Wire Center Name	Switched Lines in CBG	Switched Lines Equipped
FTWOTXLWDS0	18,418	23,023
FTWOTXMARS2	29,533	36,917
FTWOTXPERS2	30,415	38,019
FTWOTXTERS2	29,667	37,084
FTWOTXWARS2	46,438	58,048
FTWOTXWSDS0	18,916	23,645
GLDSTXGSRS0	555	694
GLTNTXSHDS0	33,533	41,916
GLTNTXSOCG0	35,104	43,880
GLTNTXWIDS0	2,361	2,951
GNVLTXGLDS0	13,397	16,746
GOLITXGORL0	4,479	5,599
GRBYTXRADS0	13,285	16,607
GRDNTXMYRS0	1,373	1,716
GRFLTXGFRS0	633	792
GRHMTXLIDS0	8,682	10,852
GRVRTXGVRS0	2,249	2,811
GRWDTXGRRS0	1,080	1,350
GSVLTXHOCG0	12,420	15,525
HBVLTXHBRS0	3,034	3,792
HERNTXHEDS0	3,581	4,476
HLBOTXJUDS0	6,898	8,622
HLCTTXHCRS0	1,908	2,385
HMLNTXHMRS0	1,720	2,150
HMPSTXHMDS0	3,820	4,775
HNGVTXFRRS0	2,042	2,552
HNRTTXBRRS0	3,393	4,241
HNVITXHNDS0	17,024	21,280
HONDTXHORS0	5,893	7,366
HRFRTXHFDS0	10,950	13,688
HRLNTXHG03T	36,641	45,802
HRMLTXHLRS0	2,632	3,290
HSTNTXADCG0	23,364	29,205
HSTNTXAICG0	40,983	51,229
HSTNTXALCG0	86,083	107,604
HSTNTXAPCG0	22,039	27,549
HSTNTXBACG0	82,519	103,149
HSTNTXBRCG0	15,938	19,922
HSTNTXBUDS0	74,415	93,019
HSTNTXBWCG0	57,417	71,772
HSTNTXCARS0	42,307	52,884
HSTNTXCHRS0	8,378	10,473

Number of Wire Centers: 528
Number of Switched Lines: 9,399,197

Wire Center Name	Switched Lines in CBG	Switched Lines Equipped
HSTNTXCLDS0	35,374	44,218
HSTNTXEERS0	54,270	67,838
HSTNTXEHCG0	19,087	23,859
HSTNTXFACG0	39,196	48,995
HSTNTXFRCG0	30,344	37,930
HSTNTXGLCG0	49,234	61,542
HSTNTXGPDS0	24,331	30,414
HSTNTXGRCG0	64,139	80,174
HSTNTXHOCG1	61,404	76,755
HSTNTXHUDS0	75,991	94,989
HSTNTXIDCG0	27,206	34,008
HSTNTXJADS1	36,068	45,085
HSTNTXLACG0	39,517	49,396
HSTNTXLPDS0	24,336	30,420
HSTNTXMADS0	10,531	13,164
HSTNTXMCDS0	24,842	31,053
HSTNTXMICG0	75,482	94,352
HSTNTXNADS0	29,176	36,470
HSTNTXNECG0	55,964	69,955
HSTNTXORCG0	100,442	125,553
HSTNTXOVCG0	37,952	47,440
HSTNTXOXCG0	42,019	52,523
HSTNTXPACG0	64,007	80,009
HSTNTXPERS1	14,958	18,698
HSTNTXPRCG0	55,543	69,429
HSTNTXRECG0	66,007	82,508
HSTNTXRIDS0	52,930	66,163
HSTNTXSACG0	20,134	25,167
HSTNTXSERS0	3,133	3,917
HSTNTXSHDS0	4,282	5,353
HSTNTXSUCG0	52,441	65,551
HSTNTXUNCG0	143,724	179,655
HSTNTXWACG0	35,079	43,848
HSTNTXWECG0	13,019	16,273
HSTNTXWLCG0	24,609	30,761
HSTNTXWYDS0	12,951	16,189
HSTXTXSDRS0	12,904	16,130
HSTXTXSMRS0	49,207	61,509
HTVLTXHVRL0	9,189	11,487
IRANTXIRRS0	4,635	5,793
ITLYTXHURS0	4,216	5,270
ITSCTXMURS0	3,299	4,124

Number of Wire Centers: 528
Number of Switched Lines: 9,399,197

Wire Center Name	Switched Lines in CBG	Switched Lines Equipped
IWPKTXBARS0	7,394	9,242
JCBOTXLORS0	5,289	6,611
JFSNTXMORS0	3,062	3,828
JSPRTXDUDS0	9,872	12,339
JSPRTXRARS0	1,453	1,816
JWTTTXJWDS0	470	588
KBVLTXKBRS0	4,045	5,056
KGVLTXKVDS0	14,926	18,658
KNDYTXKNRS0	3,238	4,047
KNTZTXKNRS0	3,308	4,136
KRCYTXFCRS0	1,241	1,551
KRCYTXKCRS0	2,194	2,742
KRMTTXKMRS0	7,119	8,899
LADNTXENRS0	710	888
LAPRTXLPRS0	278	347
LARDTXLADS0	65,030	81,287
LBCKTXFRDS0	21,930	27,412
LBCKTXPADS0	21,011	26,263
LBCKTXPSDS0	41,059	51,324
LBCKTXSWCG0	55,247	69,059
LBHLTXLHRS0	2,447	3,059
LBLLTXLBRS0	1,966	2,458
LBRTTXLBDS0	5,586	6,982
LCKHTXLKDS1	12,536	15,670
LCKNTXLORS0	2,602	3,252
LCSTTXLCRS0	1,183	1,478
LFRSTXLFRS0	1,326	1,658
LGVWTXGRDS0	20,741	25,927
LGVWTXJUDS0	8,653	10,816
LGVWTXMIDS0	4,064	5,080
LGVWTXPLDS0	31,853	39,817
LLNGTXLURS0	4,434	5,542
LMPSTXLSRS0	5,358	6,697
LMTNTXLMRS0	4,898	6,122
LNDLTXTUDS0	5,677	7,096
LSFRTXLFDS0	1,515	1,894
LYTLTXLYRS0	2,828	3,534
MARFTXMFRS0	3,304	4,130
MARNTXMRRS0	4,565	5,707
MCALTXHIRS1	7,641	9,551
MCALTXMUCG0	46,927	58,659
MCKNTXLIDS0	21,726	27,158

Number of Wire Centers: 528
Number of Switched Lines: 9,399,197

Wire Center Name	Switched Lines in CBG	Switched Lines Equipped
MCKNTXTERS0	2,968	3,710
MCLNTXMLRS0	2,410	3,013
MCMYTXMCRS0	3,373	4,216
MDLDTXMU02T	35,602	44,502
MDLDTXMUDS0	10,547	13,184
MDLDTXOXDS0	37,420	46,775
MDLKTXMLRS0	3,858	4,822
MDLTTXGRDS0	4,144	5,180
MDVITXMDRS0	6,804	8,505
MEXITXMXRS0	5,434	6,793
MINLTXLORS0	4,752	5,940
MNHNTXMODS0	6,744	8,430
MNPLTXPADS0	9,935	12,419
MNWLTXFADS0	10,654	13,317
MOLTTXMNRL0	1,105	1,381
MRCDTXMEDS0	13,851	17,314
MRDNTXMERS0	1,628	2,035
MRLNTXMLRS0	6,636	8,295
MRSHTXWEDS0	18,394	22,993
MRTHTXMARS0	574	717
MRVLTXMRRS0	3,973	4,967
MSSNTXMIDS0	17,533	21,916
MTGRTXMTRS0	1,121	1,401
MTHSTXMARS0	9,289	11,611
NBRNTXNBCG0	26,190	32,737
NCGDTXNCDS0	24,867	31,083
NDLDTXNDDS0	33,309	41,637
NRDHTXNHRL0	765	957
NWRKTXHURS0	2,059	2,574
ODSSTXEMDS0	66,257	82,822
ODSSTXLICG0	2,719	3,398
ODSSTXREDS0	11,767	14,709
OGLSTXOGRS0	1,323	1,654
OMAHTXTURS0	2,040	2,550
ORNGTXORDS0	22,700	28,375
OWTNTXTRRS0	2,442	3,052
PAMPTXPPDS0	18,859	23,574
PARSTXNODS0	3,441	4,302
PARSTXSUDS0	15,009	18,761
PCRKTXPCDS0	883	1,104
PHRRTXPHCG0	29,060	36,324
PLTNTXPLDS0	4,673	5,841

Number of Wire Centers: 528
Number of Switched Lines: 9,399,197

Wire Center Name	Switched Lines in CBG	Switched Lines Equipped
PLVWTXPVDS0	17,855	22,319
PNHRTXPNDS0	9,908	12,385
PRSLTXPSRS0	7,742	9,678
PRSPTXFIRS0	342	428
PRTNTXRERS0	3,599	4,499
PRVWTXPRRS0	4,731	5,913
PSBGTXUNRS0	5,982	7,477
PTARTXPEDS0	9,084	11,355
PTARTXWORS0	20,045	25,057
PTARTXYUDS0	38,174	47,717
PTBLTXPTRS0	1,412	1,765
PTETTXPORS0	2,759	3,449
PTISTXPIDS0	2,344	2,929
PTISTXSPDS0	859	1,074
PTSBTXSTDS0	2,391	2,988
PYTETXPYRS0	418	523
QANHTXMORS0	1,896	2,370
RCDLTXRDCG0	2,148	2,685
RCPTTXRPDS0	8,542	10,677
RDOKTXHODS0	9,808	12,260
REFGTXRFRS0	1,420	1,776
RGANTXRGRS0	145	181
RHNDTXRHDS0	4,564	5,705
RKWLTXPADS0	9,818	12,273
RNGETXRURS0	1,215	1,519
RNGRTXMIRS0	2,491	3,113
RNKNTXRKRS0	2,191	2,739
ROBYTXRBRS0	412	515
RONKTXWORS2	4,812	6,015
ROSCTXRSRS0	2,432	3,040
RSBGTXRRDS0	29,038	36,298
RTANTXRTRS0	3,651	4,564
RYCYTXNERS0	712	890
SAGSTXSARS0	9,614	12,017
SBNLTXSBRS0	2,193	2,741
SBPSTXSBRS0	1,457	1,821
SELYTXSERS0	6,559	8,199
SGINTXMQDS0	4,088	5,110
SGINTXSGDS0	14,442	18,052
SHNRTXSHRL0	1,960	2,450
SHRKTXSRRS0	2,917	3,646
SINTTXSIRS0	5,126	6,408

Number of Wire Centers: 528
Number of Switched Lines: 9,399,197

Wire Center Name	Switched Lines in CBG	Switched Lines Equipped
SKDMTXSKRS0	3,063	3,829
SKLYTXSKRS0	225	281
SLATTXSLRS0	5,971	7,464
SLCYTXSCRS0	4,886	6,108
SLSBTXSLRS0	13,178	16,472
SMFRTXSFRS0	3,812	4,765
SMNLTXSMRS0	3,993	4,992
SMRCTXXA01T	17,057	21,322
SMVLTXSMRS0	3,550	4,438
SNANTXBACG0	21,634	27,043
SNANTXCACG0	71,719	89,649
SNANTXCURS1	50,060	62,574
SNANTXDIRS1	44,102	55,127
SNANTXEDDS0	33,443	41,803
SNANTXFRRS2	92,521	115,651
SNANTXGECG0	57,342	71,678
SNANTXHEDS0	2,727	3,409
SNANTXICDS0	16,631	20,788
SNANTXJARS0	1,383	1,729
SNANTXLADS0	29,537	36,921
SNANTXLECG0	34,291	42,864
SNANTXLERS2	25,662	32,077
SNANTXLSRS0	3,369	4,212
SNANTXMCDS0	8,803	11,003
SNANTXMCRS0	2,609	3,262
SNANTXMCRS1	4,315	5,394
SNANTXPARS0	4,968	6,209
SNANTXPECG0	5,979	7,474
SNANTXPERS1	80,630	100,788
SNANTXSARS1	2,382	2,977
SNANTXSHRS0	21,845	27,306
SNANTXSLDS0	6,990	8,737
SNANTXSLRS2	6,483	8,104
SNANTXSODS0	9,849	12,311
SNANTXTADS3	52,408	65,510
SNANTXTHDS0	3,448	4,310
SNANTXUCDS0	31,552	39,440
SNANTXWACG0	26,676	33,344
SNANTXWARS2	44,141	55,177
SNANTXWEDS0	17,960	22,450
SNBNTXSBDS0	18,604	23,255
SNDGTXSDRS0	4,436	5,545

Number of Wire Centers: 528
Number of Switched Lines: 9,399,197

Wire Center Name	Switched Lines in CBG	Switched Lines Equipped
SNTNTXSNRS0	1,104	1,380
SNYDTXSDDS0	18,820	23,524
SPLDTXSPDS0	8,785	10,981
SPRGTXSPRS0	4,456	5,569
SPRNTXNODS0	17,353	21,691
SPRNTXSOCG0	19,753	24,692
SRLKTXSRRS0	3,139	3,924
STNTTXSTRS0	4,218	5,272
STRWTXORRS0	1,019	1,274
SWTWTXSWDS0	21,681	27,101
TAYLTXTADS0	19,916	24,895
TBLLTXKLCG0	19,120	23,900
TBLLTXTBDS0	7,217	9,022
TGUETXTERS0	3,763	4,704
TMPLTXLBRS0	38,589	48,236
TMPSTXTMRS0	3,268	4,085
TRMNTXTERS0	341	426
TROYTXTRRS0	258	323
TRRLTXJODS0	12,653	15,817
TXCYTXLMDS0	21,749	27,186
TXCYTXTCDS0	23,157	28,946
TYLRTXCHRS0	7,226	9,033
TYLRTXLYCG0	30,917	38,646
TYLRTXSODS0	43,322	54,153
UVLDTXUVDS0	9,696	12,120
VCTATXVICG0	40,085	50,106
VDORTXRORS0	14,570	18,213
VDORTXSURS0	2,705	3,381
VERNTXLIDS0	11,990	14,988
VLLDTXVLDS0	1,383	1,728
VNTNTXMARS0	4,295	5,369
WACOTX01DS1	47,514	59,393
WACOTXCSRS0	2,507	3,134
WACOTXEDRS0	681	851
WACOTXGHRS0	2,040	2,551
WACOTXHEDS0	4,854	6,068
WACOTXLORS0	1,601	2,001
WACOTXMDRS0	992	1,240
WACOTXMGRS0	2,030	2,537
WACOTXMORS0	10,795	13,494
WACOTXMTRS0	1,574	1,967
WACOTXPRRS1	26,950	33,688

Number of Wire Centers: 528
Number of Switched Lines: 9,399,197

Wire Center Name	Switched Lines in CBG	Switched Lines Equipped
WACOTXSBRS0	4,601	5,751
WACOTXSWDS0	17,557	21,946
WACOTXWERS0	2,908	3,635
WBRYTXWBRS0	2,128	2,660
WCFLTXCFCG0	31,426	39,282
WCFLTXNIDS0	29,896	37,369
WCFLTXTFDS0	9,036	11,295
WDBOTXWBRS0	2,054	2,568
WDVLTXWDDS0	6,034	7,543
WFCYTXGYDS0	2,306	2,883
WHTNTXWHDS0	6,938	8,673
WINKTXWKRS0	2,699	3,373
WLLRTXWLRS0	4,276	5,345
WLPTTXNORS0	2,585	3,231
WLPTTXTRRS0	2,190	2,738
WLWDTXWLRS0	411	513
WRHMTXWRRS0	1,368	1,710
WRRNTXWRRS0	1,793	2,241
WSBKTXWBRS0	368	459
WTFRTXLYDS0	9,651	12,064
WXHCTXWEDS0	20,453	25,566
YKUMTXYKRL0	12,235	15,294
YRTWTXYTRL0	6,009	7,511
ZPTATXZADS0	8,928	11,160
Total SWB Texas	9,399,197	11,748,997

Switch Curve Development

Best of Breed
Switch Sub-Group

Switch Curve Development Report

Introduction

The LEC industry, led by USWest, Sprint and Pacific Bell, is developing a Best of Breed model (referred to as the BCPM) for use in the Universal Service proceedings. This best of breed effort will combine the best attributes of the LEC proxy models currently available (the CPM and BCM2). To this end the LEC coalition has formed three design groups. The first two groups are focusing in on the Loop and expense portions of Basic Service. The third group is focusing in on the switch expenses. The efforts and methods of the Switch group are highlighted here.

The current method used by all proxy models to develop switching costs for Universal Service is based upon a switch curve. This switch curve represents total basic switch cost per line for switches of various line sizes. Based upon the characteristics of the group of customers being proxied, a switch cost will be pulled from the curve. The lookup of the curve point is quite simple. The proxy model can determine the approximate line size of the switch, the line size of the company owning the switch, and the current switch type installed at the location. However, the current downfall of all proxies is the data used to develop the switch curve. The reason for the data problems is that, currently, there is very little on the public record regarding a reasonable switch cost.

Therefore, the intent of the switch team was to replicate the switch curve function but base it on the better data. Vendor data with appropriate discounts was thought to be the ideal data source. However, this team could not get Nortel or Lucent to respond to our requests. In absence of vendor data, this team felt that company provided SCIS (Bellcore's Switching cost model) would be the comparable substitute[1].

Data Request

Attached in Appendix A is the Best of Breed (BOB) Switching team's SCIS data request to develop the switch curve, including suggested model office inputs to make resulting switch costs representative of a switch built for Universal service functionality and to make the various company data as comparable as possible.

Please, note that Bellcore owns SCIS and requested (after the data request was sent out) that the detail requested be simplified (in order to maintain as much confidentiality for both Bellcore and the Local Exchange Companies as possible).

[1] SCIS has been heavily scrutinized by many regulatory bodies. In addition, SCIS has been audited for FCC purposes in the ONA docket. Excerpts from Regulatory decisions affirming SCIS's accuracy and usability are attached in Appendix B.

Best of Breed Switch Sub-Group

Switch Curve Development Report

The BOB team complied with Bellcore's request and will only report costs by switch investment per line. In addition, the names of the participating will not be included in any of the outputs, in order to further protect the confidentiality of the LECs.

Study Participants and Data Response

The LEC participants for this study included[2]:

Ameritech
Bell Atlantic,
Bell South,
Cincinnati Bell Telephone,
Nynex,
Pacific Bell,
Pacific Telephone,
Southwestern Bell,
Sprint, and
US West.

A complete listing of the data received is contained in Attachment C. Finally, the Best of Breed team expects that, over time, more companies will respond to this study. As data is received and interest exists, this study will be updated.

Study Methodology for Switch Investments:

Based on INDETEC's prior experience in analyzing switching data, the team expected that investment data would follow a 1/x curve shape. Additionally, the team wanted to test for company, company size, and host or remote impacts.

Basic Statistical Model:
An Analysis of Variance (ANOVA) model was employed. The basic form of the model is[3]:

Per line Investment = a + b/Lines,

where,
Per line investment = Total SCIS investment / Line Size,
Lines = Line size of the switch,

---

[2] Citizens Telecom responded to our request. However, we did not have sufficient time to include their data in this analysis.

[3] In addition to the basic function of 1/x, other functions were investigated (e.g., 1/x**2, 1/ln(x), etc..). However, no other investigated function provided a better fit to the data.

a = *represents the per line cost (model output) and,*
b = *represents the fixed cost of the switch (model output).*

In addition to the above variables, the following variables were tested using an ANCOVA model (Analysis of Covariance):

Company Size = *S(mall), M(edium), and L(arge),*
Company = *A, C, E, G, H, I, L, M, N, and O, and*
Host/Remote = *H(ost), and R(emote).*

Study Results for Switch Investments

Removal of Company Data
In the analysis, two companies' data values were excluded. The first company was removed, because they do not use Bellcore's SCIS model, and therefore the comparability of the data was in doubt early in the analysis. The other company's data was removed, since it was difficult to prove the veracity of the data, especially when the data seemed well outside the normal distribution of all the other data.

Test of Additional Variables
Statistical analysis of the data from the LEC participants reveals that when all the variables are included in the regression analysis the results are statistically significant with a very good fit (i.e., an R^2 of over 70%). As stated above, the independent variables tested include the number of lines, the company, company size, and a host / remote indicator. Since the goal of the study is to develop a switch curve which will determine the investment per line based on publicly available data, it is crucial to analyze the need for each independent variable and its statistical impact on the results. If the model can be shown to be statistically significant using the most publicly available dependent variables, then the goal of this study will be satisfied.

The statistical analysis showed that company name is a significant dependent variable. This fact is probably due to several different factors which may result in unique cost structures for their switches. First, that each company has different engineering practices. Second, each company may have negotiated unique purchase arrangements with each switch vendor. Third, the way in which the cost estimates where generated may differ between the companies. While the first two factors may offer important insights into the underlying cost structures of these companies, the fact that some of the data may not have been produced in a comparable fashion becomes problematic. In any regards, the need to reveal company names in order to use the switch curve violates the need for confidential

treatment of the data and therefore the variable is removed from the data set. Also, all LEC's did not provide data, the variable could not really be used in any Proxy model.

The investigation of the type of switch showed that the host / remote indicator was not statistically significant and thus the need for this variable did not exist. Since most of the remotes are associated with smaller line sizes, there is some impact on the fit of the data. Specifically, the data seems to be strongly weighted towards the lower end which may have skewed the models curve to fit the smaller switches better. However, even with the removal of the host / remote indicator the model produces significant results, likely because the error structure seems to be evenly spread within each line size range.

Finally, the company size variable is significant, but due to the limited number of medium sized companies in the data set there is some concern that it may be difficult to keep the medium sized companies' data confidential and that there may not be enough observations in the data set for a statistically significant sample. The likely reasons why company size is significance is due to the same reasons why company name is significant. That each company has different engineering practices, may have negotiated unique purchase arrangements with each switch vendor, and the way in which the cost estimates where generated may differ between the companies. Regardless, the concerns over confidentiality and sample size outweigh the statistical impact these variable have on the analysis.

Final Model Results

After eliminating all the independent variables except the number of lines and the incompatible data sets provided by two of the companies, a statistically significant curve was produced (see the results of the in Appendix D). The resulting switch curve is:

Investment per Line = 225 + 261,871/Line size of switch.

While the R2 may be at approximately 44%[4], the F statistic reveals the statistical reliability of the model and the t-test shows the statistical significance of the number of lines variable. As can be seen in the graph of the curve (see Appendix E), at low line levels the investment per line is high (as high as $1,000 per line at ~ 337 lines). However, the curve asymptotically approaches $225 per line for large line size switches.

[4] However, please note that when all of the variables were included in the analysis, the R^2 was well over 70%.

Finally, the graph contained in Appendix F displays the error structure of the final model. This type of graph is used to visually determining the effectiveness of the model parameters. As one can see, it appears that, although their is a lot of noise in the low line count switched, no other anomalies existed. Therefore, it appears that the function 1/x fits the SCIS data well.

Study Results for Other Data

The data requested also asked for Telco Installation/engineering factor, Company size, Land and Building Factor, Power and Common Equipment factor, Percent of Messages/MOU that are local, and Switching TPIS.

The response to this portion of the data request was not as complete. Only 6 companies provided this data (of that not all of the requested data was filled in). The data was weighted together (by company size) to developed inputs into the BCPM model. The results are as follows:

Telco Installation/Engineering factor	*5.77%*
Land and Building Factor[5]	*8.55%*
Power and Common Equipment factor	*6.82%*
Percent of Messages/MOU that are Local	*75.70%*
TPIS	*Not analyzed at this time*

Please keep in mind that SCIS does not include the Telco Installation/Engineering factor or the Power and Common Equipment factor. However, SCIS does include the company discount (not requested).

Summary

The goal of the study was to provide a statistically significant switch curve using the most publicly available. We feel that we have succeeded.

This analysis will be combined with the two other Best of Breed studies which are focusing in on the Loop and expense portions of Basic Service. The team will then

[5] Some data was omitted due to inconsistencies.

use the data derived from these studies to construct a cost model to better analyze the issues surrounding Basic Services and the Universal Support Fund.

Appendix A

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FAX TRANSMISSION

To:	**See Attached List**	**From:**	**Ed Frank**
Company:		**Date:**	**January 30, 1997**
Telephone:		**No. of Pages: (including cover sheet):**	
	6		
Fax:		**RE:**	**Best of Breed Data Request**

Recipients:

The attached documents cover the industry wide data request being sent out. This request will help the Best of Breed cost proxy team develop the most defensible switch data. To that end, please provide the requested data by no later than November 12th, 1996. We would request that the results be transmitted in electronic form (via E-mail to efrank@indetec.com or via a disk mailed to the address above).

INDETEC International will act as the independent body to analyze the data and also as the screening agent to protect the confidentiality of the company data. INDETEC has non-disclosure statements with most of the companies involved. If you are unsure of this agreement or would like a new agreement signed, please contact INDETEC at 317-841-3729.

If you have any questions on any other matter related to this request, please contact me.

BOB - Switch Curve
Overview

To all recipients:

The Best of Breed (BOB) sponsored Switching team is requesting SCIS or "SCIS Like' output to develop a Switch curve to use in the BOB national proxy model. This curve will be used to "proxy' the local switching costs for Universal Service.

The LEC industry, led by USWest, Sprint and Pacific Bell, are developing a Best of Breed model that will be submitted to the FCC for use in the Universal Service proceedings. This best of breed effort will combine the best attributes of the LEC proxy models currently available (the CPM and BCM2). In addition, an intense effort is being made to populate these models with the best and most justifiable publicly available data. To this end the LEC coalition has formed three design groups. The first two groups are focusing in on the Loop and expense portions of Basic Service. The third group is focusing in on the switch expenses. The efforts and methods of the Switch group are highlighted here.

The current method used by all proxy models to develop switching costs for Universal Service is based upon a switch curve. This switch curve represents total basic switch cost per line for switches of various line sizes. Based upon the characteristics of the group of customers being proxied, a switch cost will be pulled from the curve. The lookup of the curve point is quite simple. The proxy model can determine the approximate line size of the switch, the line size of the company owning the switch, and the current switch type installed at the location. However, the current downfall of all proxies is the data used to develop the switch curve. The reason for the data problems is that, currently, there is very little on the public record regarding a reasonable switch cost.

Therefore, the intent of the switch team is to replicate the switch curve function but base it on the better data. We believe that the most reliable data would be that obtained from the vendors and/or the LEC industry. The attached sheets represents the Best of Breed (BOB) Switching team's data request to develop the switch curve. We have also attached suggested model office inputs to make resulting switch costs representative of a switch built for Universal service functionality and to make the various company data as comparable as possible.

BOB - Switch Curve
SCIS or "SCIS-Like"
Model INPUTS

For the model office run, start with SCIS or "SCIS Like" input sheets populated with actual data from each of your sample central offices used in the data request. Using this base, incorporate the following modifications into the input data to develop the appropriate outputs for the BOB switch data request.

Basic Assumptions:

- Use the most recently available generic upgrade
- Use the most recently available equipment
- Attempt to eliminate investments needed to support non-POTS services, including ISDN-BRI & -PRI services, Packet Services and CLASS Features (see **Note 1**)
- Do not include costs for AMA
- Separate Remote & Host investments, & include NCT link & and any additional host switch investments required to provision a remote switch with the Remote Switch (if possible)
- When configuring Remote Switch Applications, please use only the intelligent (i.e., self switching) remotes for Northern Telecom systems, otherwise treat the non-switching remotes as digital loop carrier.
- Try to use only End Office switches only, however End Office/Tandem Office types are acceptable, but do not use Tandem only offices.
- Exclude any "hairpin" service arrangements.

***Note 1**: When determining the line sizes for the switch, use the actual number of lines from the sample, but when developing inputs for the study convert all line types to analog lines. Exclude ISDN-PRI services and 1.544 mbps switchable interface services totally (However continue to include Integrated Digital Loop Carrier caused investments and the number of lines served off of IDLC).*

Other inputs that we should consider for all runs:

- Processor Utilization Factor (PUF) should be set to exhaust
- Include normal discounting
- Run in average mode
- No other Additional RTU's should be included
- Switch Module or Line Module memory should be set at standard levels & processor utilization be based on your engineering practices
- Use Integrated Digital Loop Carrier configurations. However, to account for the fact that current equipment will not support unbundling of a service, use the average of the Universal and Integrated Digital Loop Carrier equipment investments.
- Analog Trunk Services such as PBX lines should be treated as loops.

For all other inputs, use either data collected from the sample switch and / or the Company's standard engineering practice.

BOB - Switch Curve
SCIS or "SCIS Like"
Data Request

The BOB Switching team requests the following SCIS or "SCIS Like" output data:

- ***Each company should only provide information for those central offices whose characteristics match the combinations of switch types & line sizes that are shown in the table below.***
  - ***If more than one central office matches any particular combination, then choose one (representative) central office for that occurrence.***
  - ***By this definition, no one company should provide results for more than 27 central offices.***
  - ***Try to exclude central offices that serve predominantly Business Customers (at least 50% residential)***
  - ***When running remotes, please include*** *the investment in the host switch required to operate the remote.*

Line Sizes	DMS 10	DMS 100 end office	DMS 100 remote	5E end office	5E remote
0 - 500	X		X		X
501 - 1000	X		X		X
1001 - 2500	X	X	X	X	X
2501 - 5000	X	X	X	X	X
5000 - 10,000	X	X	X	X	X
10,001 - 25,000		X		X	
25,001 - 50,000		X		X	
50,001 & up		X		X	

Note: For those offices with remotes acting as pair gain systems, generate results for the entire office (including remote modules). Then run separately for only the Remote Modules (including the investment in the host switch required to operate the remote).

BOB - Switch Curve
SCIS or "SCIS Like"
Data Request (cnt'd)

- ***Based on these combinations, the following data is requested:***

Item	Host Switch	Remotes
Switch Type		
Number of Remotes		
Number of Lines by wire center (including carrier system lines)		
• *Host*		
• *Remote*		
Investment Totals		
• *Getting Started*		
• *Call Set-up (EPHC) (if available)*		
• *Line Termination (working plus excess)*		
• *Line CCS (O+T)*		
• *Call Type (if applicable)*		
• *SS7 Link Pair*		
• *Trunk CCS*		

- ***We would also like:***

Telco Installation/engineering factor	
Company Size (by lines)	
Land and Building factor	
Power and Common equipment factor	
Percent of Messages/MOU that are local	
Switching Telephone Plant Index (TPI)	
• *1986*	
• *1987*	
• *1988*	
• *1989*	
• *1990*	
• *1991*	
• *1992*	
• *1993*	
• *1994*	
• *1995*	
• *1996*	
• *1997*	
• *1998*	
• *1999*	
• *2000*	

Appendix B

Excerpt from FCC ONA Order (CC docket 89-79), paragraph 20.

"20. A third approach might employ a costing model, such as Bellcore Switching Cost Information System (SCIS), to develop costs for BSE type features. Many of the BOCs apparently use this model to develop incremental costs for switch-related features at the state level and, in some cases, for new services at the federal level.

Because SCIS is an established model frequently employed in the regulatory arena, requiring its use in federal tariffing would impose minimal implementation burdens and additional administrative expenses for the BOCs. By identifying incremental costs, the SCIS model would provide a floor that ensures that existing access services such as basic switching, are not subsidizing new unbundled BSEs or qualified non-ONA services. However, the model produces only a cost suitable for determining the level below which BSEs should not be priced. It does not yield a cost suitable for establishing a maximum rate. We seek comment on whether such a ceiling would be necessary in light of the overall constraint on switched element revenues, and if so how such a ceiling could be developed."

Excerpt from Ohio Public Utility Commission order (Cincinnati Bell Telephone Company, Case No. 93-432-TP-ALT), p. 56

"The Staff has reviewed the SCIS user guide prepared by Bellcore, and finds that the SCIS model provides a reasonable tool to be used to determine the incremental investment of basic services as well as vertical services. Therefore, the Staff recommends the use of this model by CBT in the development of LRSIC studies. Also, the Staff recommends that whenever the Applicant uses the SCIS model in a cost study for calculating the incremental cost of a specific service, the Applicant should submit for Staff review, user inputs required for the SCIS model run for the specific service along with the associated outputs of that run."

Excerpt from:

82. "Anderson concluded in its report that, although SCIS permits users fairly wide discretion in selecting variables, the SCIS model itself is fundamentally sound. This funding is consistent with the findings of the Commission's review of the SCIS models submitted to us in camera in December 1991. Furthermore, the results of Anderson's analysis were consistent with our conclusions, based on independent staff review, regarding the appropriate treatment for BellSouth's model office development, noncurrent SCIS models and traffic data average or marginal SCIS studies, and embedded or prospective technology mixes. The staff review process did non duplicate the Anderson effort, but examined proprietary materials from additional or different perspectives. The different emphases of each approach, however, add to the scope of review and enable us to determine, contrary to Allnet's unsupported assertion, that the Andersen study is free of bias.
83. The issues raised by Wiltel regarding sources of BSE rate variation or whether the SCIS Average Study option results in long run rates do not in any way cast doubt on Andersen's conclusion that SCIS is fundamentally sound. In the Supplemental Report submitted used to evaluate SCIS costing principles. We have examined Andersen's supplemental report in light of the Commission staff's independent review of the models, and we find this explanation to be adequate. The SCIS model is internally valid; as described above, our concerns and revisions to BOC ratemaking practices involving SCIS-based rates are directed at specific exercises of the discretion afforded carriers by the model, not at the model's internal structure. It is not a criticism of the model proper to constrain the SCIS user's assumptions, or factual inputs, to assure their reasonableness..."

Appendix C

Company	Company Size	Host or Remote	Lines	Total Inv.	Inv. / Line
A	L	R	285	$ 144,991	$ 509
A	L	R	315	$ 189,587	$ 602
A	L	H	368	$ 166,356	$ 452
A	L	H	736	$ 204,539	$ 278
A	L	R	745	$ 168,464	$ 226
A	L	R	749	$ 215,607	$ 288
A	L	R	1,533	$ 280,080	$ 183
A	L	R	1,581	$ 227,501	$ 144
A	L	H	1,689	$ 506,138	$ 300
A	L	H	1,789	$ 311,051	$ 174
A	L	H	3,404	$ 456,230	$ 134
A	L	R	3,568	$ 420,949	$ 118
A	L	R	3,748	$ 521,396	$ 139
A	L	H	4,032	$ 964,856	$ 239
A	L	H	4,418	$ 1,050,474	$ 238
A	L	R	6,235	$ 809,472	$ 130
A	L	H	6,545	$ 700,698	$ 107
A	L	R	6,658	$ 688,968	$ 103
A	L	H	7,963	$ 1,640,358	$ 206
A	L	H	7,964	$ 1,028,743	$ 129
A	L	H	15,734	$ 2,495,597	$ 159
A	L	H	18,123	$ 1,961,573	$ 108
A	L	H	34,856	$ 3,751,937	$ 108
A	L	H	38,986	$ 4,863,230	$ 125
A	L	H	58,576	$ 5,764,109	$ 98
C	M	R	345	$ 389,287	$ 1,128
C	M	H	1,670	$ 859,744	$ 515
C	M	R	2,008	$ 619,742	$ 309
C	M	H	3,300	$ 1,294,488	$ 392
C	M	R	3,596	$ 912,886	$ 254
C	M	H	5,595	$ 1,741,696	$ 311
C	M	R	7,544	$ 1,717,073	$ 228
C	M	H	14,790	$ 4,440,265	$ 300
C	M	R	17,400	$ 3,941,490	$ 227
C	M	H	41,584	$ 9,908,749	$ 238
E	L	R	217	$ 561,450	$ 2,587
E	L	R	246	$ 103,717	$ 422
E	L	R	579	$ 1,110,493	$ 1,918
E	L	R	714	$ 124,350	$ 174
E	L	R	1,192	$ 139,514	$ 117